Fifteenth Year of Publication

Industrial FINISHING

Reg. U. S. Pat. Office

Devoted to Product Finishing in the Factory

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Letters from Readers

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

Baking Lamps

We saw in INDUSTRIAL FINISHING a new method of baking enamels on steel by means of lights. We would like to know more about this development. We wonder if you can put us in touch with the people who are acquainted with this process.—B. L. Co. (Metal Cabinets).

Dipping Black

We manufacture metal parts that are stamped out of cold-rolled iron 1⅛-in. wide by ⅛-in. thick, which we finish by dipping in black enamel. We would like you to advise us the cheapest method possible of finishing this material. It is not necessary to get a high gloss finish, for the parts do not show after they are in use. We are only desirous of getting a cheap finish to give them a uniform appearance after they come off the punch press.

We are wondering if there is any cheap method of bluing them by heat treatment?

You can see our point: We are not even particular about color, just so the parts show some signs of being finished.—Y. S. Co. (Furniture).

"Rezilite"

On page 50 of November issue, you have an item on laboratory top finish made by the Rezilite Mfg. Co. We are desirous of getting a sample of "Rezilite" and ask if you would be kind enough to either tell them to send us a sample or write us giving their address, so we might get in touch with them.—O. Desk & Fixture Co.

The company's address: 903 Buena Ave., Chicago, Ill.—ED.

"Sealerine"

In one of our recent issues of "Management Information" we made reference to "Sealerine," made by a company in Detroit, Mich. This reference was taken from an item which appeared in one of your recent releases of INDUSTRIAL FINISHING.

One of our customers in Pennsylvania is asking for the name and address of the manufacturer and the price of the product. Will you kindly advise us about this?—E. S. Co.

The product is made by V. E. P. Co., 440 Lafayette Ave., Detroit, Mich.—ED.

Stain-Filler Combination

We are finishing an oak wood product a nut brown color, using a water stain, a wash coat of shellac, filler and two coats of varnish.

We want to know if anyone makes a good combination stain and filler that will be as light proof as water stain, will not shrink and will fill well. Our object, of course, is to eliminate water staining and possibly washing coating. The color must be matched to our standard colors. If

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you have information, will you kindly direct us to a reliable source for such materials?—D. Co. (Furniture).

Stain Remover

Can you give us any information about a firm that makes what is known as a "stain remover" to take stain out of the wood after the varnish has been removed? We understand there is a firm in Chicago that makes it.—Hotel Manager.

Tumbling Barrels

Can you tell us where we can get brass tumble plating equipment?—M. Mfg. Co.

Celluloid Ink

We have use for printing inks to be used on cellophane and celluloid. Please give us the names and addresses of manufacturers who can supply suitable materials, as well as information about modern methods used in this particular class of printing. — S. T. Melbourne, Vict., Australia.

Mixers Wanted

Will you kindly send us the address of some manufacturer who makes small paint mixers to intermix basic lacquer colors?—C. T. Co., Havana, Cuba.

Baking Enamel

We manufacture commercial signs and are informed that you may be able to supply us with information concerning the method of baking enamel and where such material could be obtained.—O. S. S.

Air-Dry Enamels

We will appreciate your giving us the names of two or three manufacturers who are in position to supply a specially good air-dry enamel.

We manufacture kitchen cabinets, kitchen stools and kitchen tables and desire a good material, regardless of cost, which can stand resistance to water, soap and other alkalies. In fact, we want something

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that can stand strong kitchen usage. If there are some firms who can make this material washable, it would be better.—L. Y. Co., Mexico.

Fluorescent Paint

We too would like more information about black fluorescent paint.—K. E. Co. (Refrigerators).

Buffing Methods

One of our customers is interested in obtaining full details about buffing methods and equipment. Our Mr. Smith mentioned to the writer that sometime ago he contributed an extensive article covering this particular operation and the methods recommended. We believe this article appeared in your September, 1936, issue and we would appreciate it very much if you would send a tear sheet of it direct to our customer. If you have any extra copies, we would also appreciate receiving one or two of them for our own files. —O. L. Co. (Lacquers).

Copies have been sent.—ED.

Porcelain Repair

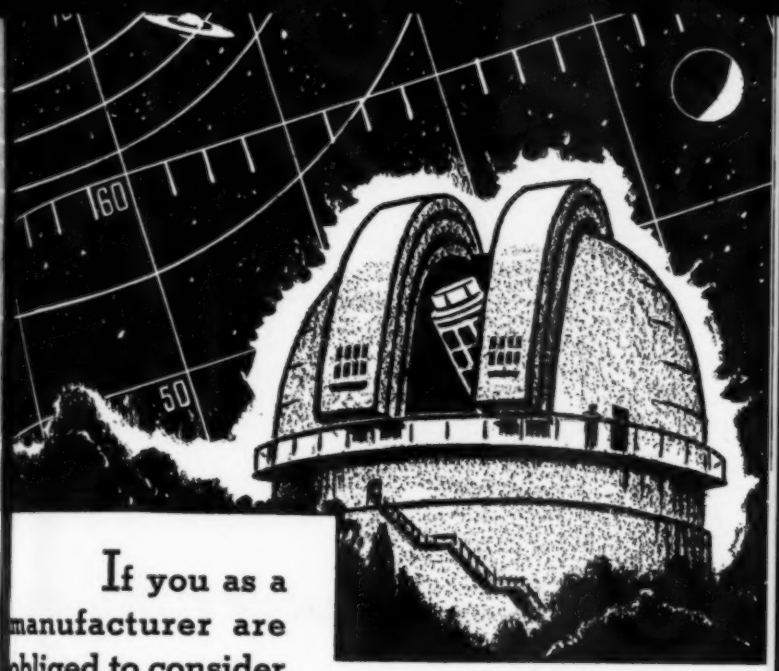
According to one of your recent editions of INDUSTRIAL FINISHING there are several types of porcelain repair finish on the market. We would like to obtain samples or the source of supply.—M. T. Corp.

We are interested in a recent item which appeared in INDUSTRIAL FINISHING—we believe the October, 1938, issue—having to do with materials for the repair of porcelain enamel. Will you kindly furnish us either with the name of the manufacturer of such materials, so that we may contact them direct, or provide us with additional information regarding such materials?—E. T. Co. (Dental Equipment).

Rustproofing Material

In an article by W. R. Allen on "Finishing New Aircraft" in INDUSTRIAL FINISHING magazine, July, 1938, issue, mention is made of rustproofing materials used on the insides of airplane tubing. There was a footnote offering to give the names of these materials on request. We would appreciate your sending us

(Continued on page 61)



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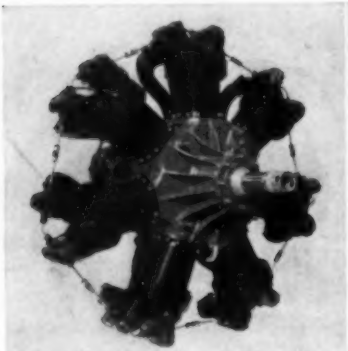
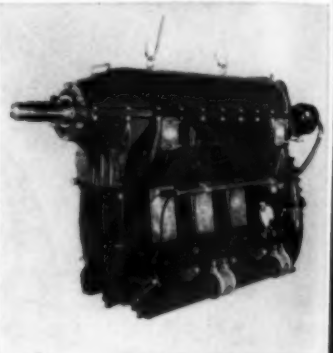


A Kinner SC-7, 370 hp. engine.



Menasco model C4S Pirate.

Finishing Airplane Motors

THE PROCEDURE for finishing airplane motors of all types is practically the same, but it might be well to call attention to a few technical details in connection with various parts of airplane motors—the metals used, the manufacturing procedure and preparation of surfaces for painting.

Crank cases, as a rule, are cast of magnesium alloys. Barrels of cylinders are steel with metal alloy fins. Intake manifolds are cast steel or aluminum alloy castings.

When castings are received, preparatory to the work of assembling them into a finished motor or engine, different parts are sandblasted, cleaned and machined. Cylinder heads are buffed and sanded with flexible-shaft rotary files and buffing tools. Barrels of intake manifolds are sandblasted with exception of the ends, which are machined or faced for a tight fit at points of contact with crank cases, etc.

Next, all parts are thoroughly steam cleaned with solutions recommended by various cleaning-compound manufacturers. Great care must be exercised in selecting these solutions; they must be absolutely neutral, or a film deposit will be left which might be harmful to the primer and baked enamel finishes after they have been applied.

Prime Coating Castings and Enameling Completed Engines

Castings to be machined should be primed before they are sent to the machine shop for facing and machining. This is recommended because the primer thoroughly seals the pores in the metal, preventing the casting from absorb-

Cleaning and prime-coating parts for engines; enameling assembled engines; finishes for instrument boards, seats, doors, fixtures and interiors, etc.; fire-resistant coatings, sound-proof adhesives and improved aircraft specialties.

and Interiors

BY W. R. ALLEN

Interior of airplane passenger cabin.

ing the cutting oils used as lubricants for machine tools. Later, these parts are touched up where the primer has been scuffed away during machining.

A first coat of baking enamel is applied to the inside and outside of crank cases, cylinders and other parts to be finished, after which they are baked in an electric or gas oven at the temperature recommended by the manufacturer—usually from one to 1½ hours.

Sanding between the first and second coats of baking enamel is optional; as a rule, it isn't done. If the castings are rough, the manufacturer depends upon the filling and building qualities of the enamel or finishing material to make the surface smooth. For a real finished job, however, the first coat of baking enamel should be sanded with No. 240 sandpaper.

After 500 hours of service in the air airplane motors are overhauled, the paint is removed and they are repainted. They are washed and wiped after every trip. Various methods and paint-remover materials are used to remove the baking enamels during the overhauling process, after which the refinishing procedure is the same as the original finishing.

Wrinkle Enamels on Instrument Boards

Wrinkle enamels make an ideal finish for instrument boards, which are fabricated from aluminum alloy metals. The metal

is thoroughly cleaned with a suitable metal cleaner or wash-up thinner and immediately coated with zinc chromate primer to prevent any accumulation of moisture on the metal. Before applying the enamel it should be strained to remove any lumps or specks which may be present in this type of material. It should then be applied as a full wet coat and baked at exactly the time and temperature recommended by the manufacturer.

Wrinkle enamels are made in all colors and shades to produce a fine, medium or coarse wrinkle finish when baked. One prominent eastern manufacturer has produced a wrinkle finish that has the appearance of genuine old damask cloth, after it has been baked.

Control levers; Seats; Fixtures

Control levers are cleaned with a metal cleaner and then coated with zinc chromate primer, which should be allowed to dry for at least 24 hours. Then they are finished with synthetic baking enamel—usually black. Hand grips are finished with colored synthetic baking enamels — usually red or orange for visibility and to dress them up.

Seats for pilots and co-pilots are usually finished with the same materials as the instrument boards. They are fabricated from aluminum alloy metals and are prepared for painting in exactly the same manner as has been described for cleaning aluminum alloy metals (in this and in my previous articles) applying zinc chromate primer and, after it has thoroughly dried, coating the seats with wrinkle enamel or a suitable synthetic baking enamel.

Passenger seats are also fabricated from aluminum alloys and are finished to harmonize with the general interior color scheme. A wide range of colors in both lacquers and synthetic enamels can be obtained for interior trim purposes by using a leading manufacturer's portable laboratory system which makes possible 2000 different colors, shades and tints. The same colors can be produced from the same laboratory in any quantity in very durable and attractive synthetic baking enamels. This system has been in use for some time by a leading west coast airplane manufacturer and has proved to be of great value.

Air ducts, light sockets, pantry doors, toilet doors, and other metal fixtures and parts are fabricated from aluminum alloys and are finished in lacquers—or air-drying and baking synthetic enamels—according to the specifications of the customer or the recommendations of the airplane company's engineering department.

Inside Walls and Headlinings

Side walls and headlinings of 'planes are generally covered with fireproofed cloth. In a recent order from one of the transcontinental airlines acetate dope was specified and used as the finishing material for interior trim. Two of the several reasons for using acetate dope are: 1) It can be easily cleaned, and 2) it is more fireproof than nitrate dope or cloth—unless the cloth is kept fireproofed with solutions made for that purpose.

Plywood frames are first laid out in sections to fit the contour of the interior of the fuselage. These frames are covered with

airplane fabric which is drawn as tightly as possible before tacking it into place. Two coats of clear acetate dope are brushed into the fabric, allowing the manufacturer's recommended drying time between coats. When thoroughly dry the second coat is lightly sanded to knock off all the nibs, after which three coats of pigmented acetate dope are sprayed on. The last (fifth) coat is sanded and rubbed to a dull satin finish.

This system has a decided advantage from a maintenance standpoint because a hose can be turned on the finish (after removing all seat cushions, rugs, etc., from the 'plane) to wash it down with water and soap or a cleaning solution. Also, if any part of a section is damaged or burned by cigarettes, or cigars, new sections can be replaced quickly and economically.

Fire-Resistant Coatings

A foreign Air Transport Co. recently presented a Southern California airplane manufacturer with some difficult paint problems in connection with an order for transport 'planes. I was asked for suggestions and cooperation in having certain paint products for this order manufactured according to the specifications, which were as follows:

A test piece shall be prepared by applying the process or treatment (which it is desired to test) to a strip of soft wood 12-in. long, ½-in. wide and ¼-in. thick. The test piece shall be suspended vertically in a room free from drafts. A Bunsen burner flame 1½-in. long, from an orifice 5/16-in. in diameter, shall be placed below the test strip, the orifice being 1-in. from the end of the strip, for 30 seconds; then the flame shall be removed. After action has ceased, the surface of the specimen shall be cleaned to expose the wood. The measured length of the charred part shall not exceed 3-in.

One interesting development which met their requirements and specifications, in connection with this order, was a fire-resistant floor coating for the balsa wood floors. This material is as nearly fireproof as any I have ever seen or heard of.

Sound-proofing Adhesive

While discussing the finishing of airplane interiors I would like to call attention to a specialty product developed especially for aircraft. Before an airplane is trimmed it is sound-proofed throughout with a lightweight material that is very high in acoustical properties. This material comes in sheets of various thicknesses and is cut to fit the contours of the various sections of the interior of the fuselage, cockpit and other parts to be sound-proofed.

Previous to the development of this specialty, sound-proofing materials were fastened to the walls and headlinings of 'planes with an adhesive similar to glue. However, after a period of time this glue or cement would become soft (when 'planes were subjected to the extreme heat of the sun's rays at the various airports throughout the U. S.) causing the sound-proofing material to pull away from the sides of the 'plane. This frequently necessitated pulling large sections of the trim out and recementing in place again.

(Continued on page 56)

Fig. 1—Blond wood furniture, painted walls and illuminated niches in manicuring room.

Custom Wood Finish Jobs

BY F. R. BOYNTON

WOOD FINISHING today is a commercial art. Greater public appreciation of interior decoration has brought about a realization that the selection of color and texture of finish for the wood used in store fixtures and architectural trim is being done with the same care that an artist observes when he selects a frame for his painting.

The wood finisher is confronted with an array of finishes that may confuse even the most experienced man, unless his working methods are based upon a thorough knowledge of the most modern stains, fillers, lacquers, enamels, varnishes and other materials. A steady change has taken place in the kinds and grades of woods used in cabinet construction. This calls for a complete working knowledge of these present day woods.

To make the finisher's task even more difficult, architects' and customers' specifications change constantly, to keep pace with modern furniture styling and period designs. The demand is always for something new and different. Upon entering a large department store, or any uptodate retail shop, one expects to find quality. The display of merchandise in and surrounded by modern trim and fixtures leads to a feeling of confidence and a desire to buy, which are important sales factors.

Color blocks are made up by the finisher and submitted to the architect or customer for approval.

Fig. 2—Showcases, wall cases and ornamental band are avodire, trimmed with white maple.

on Modern Store Fixtures

Photographs of work produced by the Wiegel Cabinet Corp., Indianapolis.

Color blocks or pieces of old fixtures are also sent in to be matched, and these old colors are sometimes a problem to match, as often the wood used for the new fixtures is of an entirely different texture.

Nature has produced no two woods exactly alike. Each kind differs as to its hardness and figure, fine or coarse texture, open or close grain, and light or dark colors; and there are medium degrees of all of these characteristics which would place them in two or more classes.

The kind of grain a wood has is an important consideration when it comes to the finishing method to be employed. Some woods have a beautiful grain and figure and color shadings, and are suitable for large rooms, while those with smaller grain, of the same group, are better suited for showcases and cabinets. As for the natural colors, staining and artificial coloring add to the beauty of the natural grain—provided the grain is not obscured.

The characteristics and merits of oak are well known, so I will not take time to describe them here. There are about 300 kinds of oak in the world—about 50 of them in the U. S. Of all these kinds, they may be generally classed as white oak and red oak. White oak is more durable, less porous, finer textured and has a better color than red oak, but both are used and are sometimes placed side by side in a panel.

Pollard oak is interesting be-

cause of its unusual grain figure. This variety is grown in sections of Europe. The small limbs of this tree are cut into rounded heads close to the tree and as the tree grows larger the stunted heads are included in its growth. When the tree is cut into lumber these heads produce burls or knots which form unusual grain figures. This oak may be termed a cultivated variety.

Some kinds of red oak are so red that it is impossible to produce very light gray finishes on them unless the red color is killed. This may be done by first brushing or spraying on a light green aniline stain and letting it dry. The wood will then be toned to take a gray or brown stain much more satisfactorily. This toning is needed as much for light brown oak stains as for the gray. This also holds good for maple, birch or other woods that have a tendency to show a pronounced reddish cast—which is usually undesirable.

American Walnut

American walnut, owing to its remarkable strength, hardness, variety of grain, figure and color, has become quite popular for fixtures and wood trim. The biggest problem in the unselected wood, is the light sap and dark streaks. The sapwood may be satisfactorily treated with iron salts; sulphate or chloride of iron will produce the natural gray color of the wood, while nitric acid will lighten the dark streaks. The acid is diluted with from four to six parts of water, and produces a yellow stain. It is permanent to strong light and lasts longer than the yellow anilines, but it takes 24 hours to complete its action. When used stronger, the resulting color is a reddish or brownish yellow, depending upon the kind of wood treated. This is a highly corrosive liquid.

Several varieties of light colors may be produced without bleaching. After the wood has been satisfactorily toned, a wash coat is applied—preferably a bleaching lacquer, as this eliminates a sanding operation and is water white. The filler is tinted with raw sienna or used in combination with burnt sienna or burnt umber. Burnt umber is also used alone—just enough to keep the natural filler from showing gray in the pores. After the filler has dried, any additional toning is done and the regular finishing is carried out.

Prima Vera; Avodire; Royal Tartan

Prima vera and avodire have been used for years in store fixture construction. The color of prima vera is a light golden brown, avodire is somewhat darker and has a more mottled grain figure. These woods finish beautifully, either in their natural colors or stained. It is not necessary to use bleach, as prima vera comes very light; however the use of a tinted filler gives the finish more depth of color and a more pleasing appearance.

The wood is open-grained and filling is necessary. Natural filler tinted with French ochre or raw sienna is preferable. White maple, used in conjunction with this wood, produces some interesting combinations. An illustration of how this wood is used in showcases and trim—the light wood around the cornice and pilasters being white maple — appears in

Fig. 2. Walnut is also used for the same purpose. The final finish is gloss lacquer—rubbed with oil and pumice stone.

Royal Tartan can be obtained only in veneer. The hard places in this wood are reddish brown, while the softer places are a buff color. It takes a beautiful natural finish. The grain is open and requires filling. Cornice pilasters and base are made of small-figured quarter-sawed oak and are stained to match the veneer. I believe sycamore would have a more suitable grain figure than oak.

Staining the Wood

Water-soluble stain powders are used when stain is applied. Earth colors are used to tint and color fillers. Non-grain-raising stains, though fast to light, would be difficult to apply on account of the large surfaces encountered in this type of work.

When applying water stain to large surfaces, it is best to flow on a wet coat. Soft streaks in the wood may be wiped with a rag, while the harder streaks are left to absorb more of the stain. Light and dark streaks are uniformed by applying more stain to the light places while the dark streaks are wiped and blended. A finisher who is acquainted with the different characteristics of this wood can apply the stain very quickly.

Filling the Wood

Filling forms the foundation for the finish and gives depth to the color. Results will be according to the drying time and attention received. Silica or silex is not used much for fillers any more. New and better inert materials are being used; among these are Dicalite and Pyrex. Pyrex is the latest, and when combined with a special oil, the filler dries hard and firm overnight without the use of a drykiln. This filler does not lift when the sealer is sprayed on, as was the difficulty with some of the old type fillers. This insures a harder, tougher and more flexible film—even with the cheaper grades of lacquer. A cheap lacquer will

show surprising flexibility and adhesion over this type of filler.

Sealer and Finish Coats— Followed by Rubbing

For high grade fixtures a double-head coat of sealer is sprayed on. Owing to the large surfaces included in fixtures, a somewhat slower-drying sealer than what is used ordinarily, is applied — to eliminate the fog and nibs that are formed by a fast-drying sealer.

After the sealer has dried and the surface has been thoroughly sandpapered, two double-head coats of clear lacquer are applied, allowing the proper time to dry between coats. Since fixtures receive considerable abuse in service, the lacquer coating has to be able to "take it"; a good grade of tough flexible lacquer should be used, as the fixtures are warranted for one year against defective workmanship.

The workmen entrusted to do the rubbing must have considerable skill and experience to be able to perform this operation satisfactorily. A properly rubbed surface will compare favorably with the polished surfaces of marble or granite. Much of the high grade rubbing is done with paraffin oil and 3F pumice stone, although a very good job can be turned out with fine wet-or-dry sandpaper, used with water. This will eliminate a great deal of hard labor, as well as preventing any pumice stone from showing white in the corners after drying; also, it saves a lot of cleaning and wiping. Rubbed-through places can be built up by the French polishing method—which saves the expensive operation of recoating.

(To be continued)

Industrial Safety Booklet

"Greater Industrial Safety," a compact 12-page booklet stressing ways in which modern cleaning methods and materials provide increased safety of plant, product and personnel, has just been issued by Oakite Products, Inc., 14 Thomas St., New York, N. Y.

Designed to serve as a guide pointing out various industrial maintenance operations where improved safety is an essential factor, the booklet concisely reviews effective ways to eliminate commonly recognized fire hazards and fire conditions. Copies are available free on request.

Swedish peasant designs, another phase of the Swedish influence, are gay and colorful with enameled trims splashing color on simple maple pieces. This grouping is one of the many variations of Swedish peasant furniture shown during the fall market at the American Furniture Mart in Chicago.

Clean Metal Surfaces

THE FOUNDATION OF A DURABLE FINISH

BY JAMES A. BEDE

More emphasis is being placed on thoroughly cleaning all metal surfaces before finishing because when this is done many sources of trouble and expense in finishing are removed... and the resulting finishes last much longer.

THE METAL finishing industry as a whole has, in recent years, tended to place more and more emphasis on cleaning as a vital operation. Gone forever are the haphazard attitude and the equally haphazard methods of former years. No manufacturer who attempts to turn out quality merchandise can afford to slur over the cleaning operation. If he does so, he invites trouble, such as a high percentage of rejects, waste of paints, slowing up of production, and many other troubles.

Unfortunately these troubles are often attributed to some other cause. For example, a persistent tendency to sag may be caused not by improper spraying but by an oily or greasy surface of the metal, although this greasy condition may scarcely be perceptible to casual observation. Furthermore, a premature breakdown of the finish on an article can often be traced to an unclean condition of the metal at the time it was finished. Proper thorough cleaning must be regarded as the foundation for all good finishing.

A properly cleaned metal is one that has had all foreign or loose substances removed from its surfaces. Except for specially treated surfaces, such as galvanized, the foreign substances to be removed consist of organic matter, grease and oil, and inorganic particles such as grit, dust, dirt, etc. The cleaning operation should remove the foreign substances belonging to both groups.

In all cases, grease and oil must be removed, but for some types of finishing dust and grits present no special problems. On the other hand, for some finishes, such as japan and synthetic enamels, these loose particles must be completely removed. Some drawing compounds used in steel stampings leave a chalky residue that is very difficult to remove.

Dust control in certain factories presents the most stubborn of all

problems, necessitating the installation of air-filtering equipment for the spray room. Each factory and each article manufactured presents its own individual set of problems, all of which must be considered before selecting a method of cleaning.

There are many cleaning methods some of which are: Washing with a solvent such as gasoline or naphtha, vapor-type degreasing machines, boiling caustic solution baths, sandblasting, burning off in ovens at high heat, etc.

Hand washing or wiping with solvents is probably the most common and also the most inefficient of all methods. It is hard to coax grease out of the pores or crevices of metal, and even with the most conscientious workman the human element enters to cause some parts of the work to be slighted and improperly cleaned. At best it is the most expensive and most labor wasting of all methods, and should be used only when no other method is practical.

Vapor-type degreasing machines have been described in this magazine before. Their great value as a degreasing method is attested by their phenomenal growth. They have filled a great need for certain classes of work. On the other hand, some concerns have found the caustic solution method to be the best and most practical for their cleaning requirements. The usual cycle is to immerse the articles in one or more tanks of a boiling chemical solution, followed first by a cold water rinse and then a hot water rinse. This method removes both grease and dust.

The manufacturer who is not using a foolproof method of cleaning can very well give this matter serious thought. Many others have achieved surprising economies and improvements in the quality of their finishing by setting up and using a modern cleaning method.

The following comments on the foregoing article and one that appeared in November issue, are offered by Detroit Rex Products Co.

It would be our suggestion to eliminate the discussion on, or speak more strongly against the use of naphtha, gasoline, spirits, and other inflammable and explosive materials for industrial cleaning, and instead devote more space to emphasizing the safety of solvent degreasing equipment which makes use of stabilized, chlorinated hydrocarbons which are non-inflammable and non-explosive.

In this discussion of solvent degreasing, it should be emphasized that *there are three fundamental methods*, each of which has specific applications. The vapor method is primarily limited to work of heavy gauge and with simple oil or grease contaminations, so that sufficient of the solvent can condense on it to give a thorough cleaning action before the metal is heated.

The immersion method generally makes use of a cycle of cleaning operations consisting of immersion in the boiling solvent to remove the heavy contamination and insolubles, immersion in a clean solvent rinse, and immersion in pure solvent vapors for a final complete cleaning action.

The third method usually consists of a vapor-spray-vapor cleaning cycle; the solvent being applied by force pressure sprays of clean distillate to thoroughly

flush off the work and cool the metal for a final vapor cleaning action.

These additional comments are from G. S. Blakeslee & Co.

We have two cleaning methods, namely, degreasing and the alkali cleaning process. Naturally, we are interested in these and feel that they have been developed in order to help various manufacturers get away from the use of flammable solvents. As a suggestion, we feel that perhaps too much stress is given to the use of naphtha and such flammable solvents for use in metal cleaning. This is not made from the standpoint that it is competitive to our line of equipment, but from the fact that such solvents present a definite hazard and are dangerous. Most concerns that we have worked with are anxious to get away from the use of flammable solvents.

As another suggestion, we refer to the paragraph following the one in italics. The recommendation given degreasers is very fine and will, no doubt, be appreciated by the other manufacturer of this equipment. There are several phases of degreasing, as mentioned, namely, the liquid immersion and the vapor phase, used for different cleaning applications, and we and the other manufacturer of degreasers recommend the different phases for different jobs. In other words, no manufacturer recommends only the vapor degreasing process, nor does any one manufacturer recommend only the liquid immersion process, but he first makes an analysis of the customer's requirements and then recommends the proper type of equipment.

Colors at Paris Auto Show

Although black was the leading color at the Paris Automobile Show at the Grand Palais, which opened October 13, last, maroon and gray stepped well toward the front and were the two most popular colors shown by the dealers, more than half of the cars entered by those exhibitors being in these two colors, according to P. H. Chase, color specialist of the Duco Color Advisory Service. Black, however, was dominant in the exhibits of the manufacturers and, also, occupied a prominent place in the displays of the bodymakers.

Most of the exhibits were in one color, including the fenders, but chromium belts were used to a great extent while that metal was also much in evidence on the hood, for the louvers, and in some cases as ornaments for fenders. Chromium has found its greatest use on the French cars exhibited this year. Moulding carrying thin stripes of contrasting colors was only moderately in evidence. There were a fair number of colors in metallic, but fewer than were shown last year.

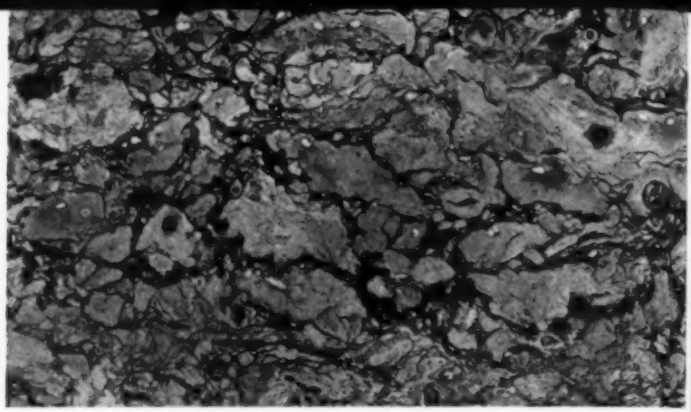
A greater amount of leather and lacquered fabrics were used this year than heretofore. This was probably due to the greater number of open cars.

New Industrial Technical Division at Red Spot Paint & Varnish Co.

Because furniture production has been speeded up by the use of conveyors and humidity-controlled ovens, finishes must be made to fit in.

Accordingly, the Red Spot Paint & Varnish Co., Evansville, Ind., recently added to its experimental and technical division a new room in which a humidity-controlled oven has been installed. This room is for the sole purpose of testing finishes under the actual conditions that prevail in any certain plant.

When a problem presents itself a panel or an entire piece of furniture is put through the finishing cycle. Actual operation of factory production is strictly followed. The experimental piece is then placed in the oven regulated to correspond with the conditions of the plant in which the problem has arisen. It is left in the oven a specified length of time, removed and inspected. Accurate reports, along with the oven controlled graph, are then presented for approval and the problem whatever it may be is solved.



Marbleizing BY DIPPING IN *Floated Colors—II*

BY WILLIAM VAHLE

TO REPRODUCE MARBLE that has two or more colors, as in black and gold marble, this same process is used — the process described in Part I of this article, see October issue of INDUSTRIAL FINISHING. In black and gold marble the gold lines or vein effects predominate. The gold color is made up by using chrome yellow orange and toning it down with a little raw sienna and some light grey, which is made by adding black to white and chrome green medium. In forming the lines in the tank, the majority of them will be gold, with a few light grey and green lines.

Use the same method in forming the design in the water, as in the first experiment. A few light grey and green lines should be formed in the water at approximately a 90° angle to the gold lines. By doing this the light grey and green lines will blend into the gold lines, giving the shaded effect as is found in genuine black and gold marble. This same process is used in imitating marble that has two or more colors on a solid background.

Creating Background Effects

In certain marble, where the background effects must be reproduced in addition to the vein lines, the process varies somewhat. In the "film solution" the background color should be added, whichever it may be. If there are one or more colors to the background of the marble, individual solutions with the separate colors should be made up. The background color,

which is only a tint or shade of the actual solid color, is obtained by adding 1 to 2-oz. of japan color to each pint of "film solution." The background color that predominates is sprinkled into the water. Wait about 10 to 15 seconds between the first and each succeeding color you put in the tank thereafter. By waiting this short length of time, these colors will not intermix so as to form one solid color or tint. The solution sets the moment it drops into the water, and any solution dropped in thereafter will not dissolve the previous solution. What actually happens is that each solution dropped in after the first one, breaks the "film" in the previous solution and fills in the breaks, in whichever area it may fall.

The vein lines are then drawn into this pattern, using the same weaving motion I have already described, the marble design is condensed, and the object dipped.

You will have occasion to use this method in imitating a marble known as "Rose de Brignoles". The object to be dipped is first painted white, which is the background color of this marble. A tan shade of japan color is made up. This is the color that predominates in this marble. It is then mixed in the film solution as described. The vein lines are a medium brown in color. The design is then drawn in the water and the object is dipped—face down.

Creating Marble Effects That Have No Vein Lines

In marble that has no vein lines, the process again varies somewhat, as in reproducing marbles known as Benou Jaune and Breche Rose. The background color of both these marbles is white. In Benou Jaune marble the predominating color is a light tan. This color is made up of one part varnish, two parts lacquer thinner and ¼ to ½ part color. To these mixtures a drop or two of boiled oil is added. Add twice as much oil to the predominating color mixture as you do to the others. This will cause the first mixture to spread more and keep the others compact, which is as should be, as the other colors are not as visible in the finished marble design. Then, by using the same weaving motion as heretofore explained, the various colors are broken up to form small islands of irregular sizes and shapes. This design is then condensed and the object is dipped.

This same procedure is followed in all marble you want to imitate —that has no vein lines.

After each dipping the cleaning board is lifted out of the tank and all residue paint is pushed to the back of the tank. The board is left there for use in condensing each marble design that is made thereafter. This is done after each dipping so that you will have a clean surface on which to form a new marble design. The tank is drained and cleaned at least once a year.

Explanation of What Makes the Marbleized Design

It is useful to know what takes place in the water when creating your varicolored marble designs. When the film solution is dropped into the water it forms a fine skin or film on the surface of the water. This film is broken when you draw the stick through the water, depositing the paint in the crack or tear. The width in the tear

will depend upon the amount of oil you have in the japan color—that is, the more oil the wider or broader the pattern of the vein line; the less oil, the narrower the line.

The weaving motion breaks up the film, causing the paint you have deposited in the cracks to surround small irregular islands that are formed by this motion—due to the fact that oil floats and seeks to spread but cannot because of the film on the surface of the water. In making marble designs that have no vein lines the heavier solutions, sprinkled in after the first solution, break the film where they drop and spread very little. This is then agitated, causing the formation of small irregular islands of various interblended colors. Japan colors are used because they are lighter in weight compared to most others, consequently they float easier.

This marble finish can be baked, either by using a clear baking lacquer or a synthetic varnish. It has been tested for this purpose, having withstood a temperature of 600°F. before showing signs of peeling. This was due to the minute amount of oil that the japan color retained.

Additional Details About This Marbleizing Process

The following added remarks are in reply to the Editor's request for more information and a clearer explanation of some features of this marbleizing process.

In regard to the preparation of wood or metal surfaces which are to be marbleized, the first coat of paint applied to a wooden surface is a flat lacquer. When dry, the surface is sanded and given one or two coats of gloss lacquer.

The surface of the article to be dipped should be thoroughly dry before dipping—and it is dipped face down. Metal surfaces receive the same treatment. Metal surfaces that are to be baked, are given one or two coats of baking lacquer. The article is then baked. When it has cooled it is then dipped in the marble design and placed in upright position to permit the water to drain off. When the water has drained off and the surface is thoroughly dry, it is then given a coat of clear baking lacquer and baked.

Surfaces that are to be dipped should be thoroughly dry before dipping. There is no particular preliminary treatment for any surface. The colors used will adhere to any surface.

Objects that are dipped are placed at an angle to allow the water to drain off and dry. There is no particular position to hold the object in after it has been dipped, to remove the water. Any clinging moisture can be dried by using a spray gun and blowing it off with compressed air.

The film of colors attaches itself to the object during the down stroke, as the surface is dipped face down. Colors should not lay on the surface of the water more than five minutes after the design has been formed, as too long a wait between then and the time of dipping will allow the colors to dry up, causing the loss of their adhesive qualities. Colors will adhere to any surface due to the fact that they contain oil.

If you wish to apply the marble design to screw driver handles, insert dowel pins (about 6-in. in length) in the holes drilled in the handles for the driver. This will enable you to dip the handle with-

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out touching the handle itself. In dipping a larger turning such as a column, the turning need not be immersed below its center line. It can be immersed from ½-in. to 1-in. beneath the surface of the water and rolled over the surface of the water to collect the marble design till the entire turning is covered with color. Columns 5 to 6-ft. in length or longer can be dipped by inserting 10-penny nails at each end and having two people do the dipping — rolling the column over the water till the film of color covers its entire surface.

Background effects are the various interblended shades of solid colors. As for instance, in reproducing a marble known as Rose de Brignoles. The surface of the object to be marbleized is painted white. This is then allowed to dry thoroughly before dipping. The background color of this marble includes various shades of a tan color. These various shadings of that color make up the background of that particular marble. The vein lines consist of a medium brown color; they are drawn in the background solution in the manner already described.

A sample of a marble which I have finished for displaying will enlighten you on the subject of "Creating Background Effects." The sample is a light green marble with brown and black vein lines. This sample was sprayed with a white flat lacquer. When it had dried it was sanded and given two coats of gloss white lacquer, after which it was allowed to dry thoroughly. The green color, which is the background effect of this marble, was a chrome green medium and was added to the film solution as prescribed. This solution was then sprinkled in the water, and the black and brown vein lines were drawn in the water, after which the design was formed. The sample was then dipped in the water and the pattern picked up. It was then placed in an upright position and the water was allowed to drain off and dry. After this it was given two coats of clear lacquer.

All surfaces of marbles that you are going to imitate are painted white, except the marbles that have a solid background, as in black and gold, verdi antique, etc. These are painted with a flat black lacquer, sanded, and given one or two coats of gloss black lacquer, after which they are dipped.

Self-Polishing Wax

Interesting information about "Dwinax" self-polishing liquid wax for furniture, woodwork and automobiles, appears in circulars and bulletins which have been prepared for distribution by the manufacturer, Baldwin Laboratories, Inc., Saegertown, Pa. Dwinax contains No. 1 carnauba wax—the hardest and glossiest natural wax known. This wax is claimed to have maximum wearing qualities.

Furniture Design Suggestions

Announcement of an "Exhibition Clinic" of "creative designs in home furnishings as applied to contemporary living," to be held at the American Furniture Mart on January 10, during the winter market, was made following a meeting of the directors of the American Designers' Institute. Any designer, who is a member of the Institute may submit sketches it was ruled.

The exhibition, it was decided, will not be competitive and no award will be made at the first showing. The clinic, it was explained, will be substantially a "thinking out forum," giving the designers an opportunity to show their conception of probable future developments in the home furnishings field. All sketches must be made on standard illustration board and must be 20x24-in.

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Wrinkle Finishes

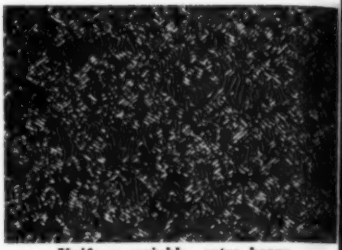
BY G. KLINKENSTEIN
Vice-President & Technical Director,
Maas & Waldstein Co.

WRINKLE FINISHES, which have long been used for finishing many different kinds of metal products, owe their characteristic rough surfaces to what was originally considered a serious defect in China wood oil.

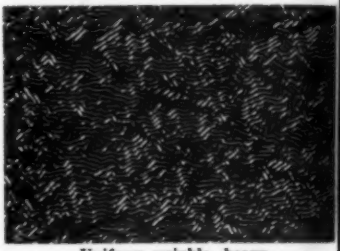
When this new oil was first introduced into this country as a substitute for linseed oil (about 25 years ago) varnish and enamel manufacturers found that its film tended to crinkle badly on drying. Accordingly, they condemned it as useless for their purposes. Later experience showed that the new oil, when properly handled, was a most useful ingredient for certain types of finishes. Even its crinkling properties were utilized for producing wrinkle finishes.

Wrinkle finishes quickly became popular. They are attractive in appearance and exceptionally durable; and, since they can be sprayed directly on rough metal surfaces and will effectively cover minor irregularities with one coat, they are economical to apply.

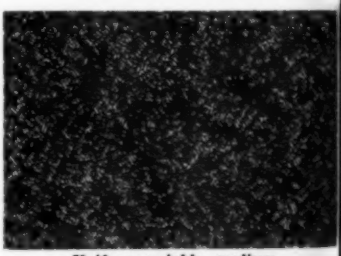
As originally produced, however, wrinkle finishes had certain



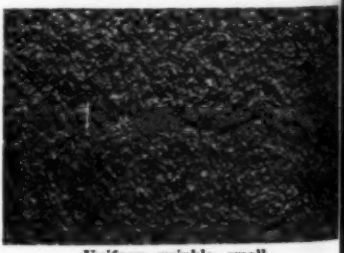
Uniform wrinkle, extra heavy.



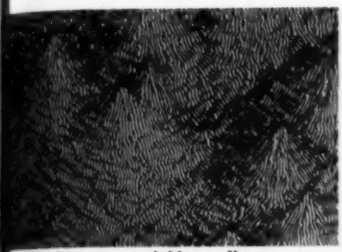
Uniform wrinkle, heavy.



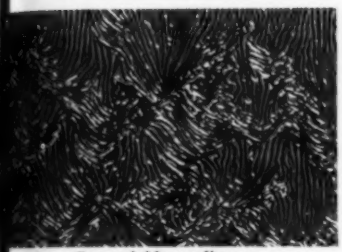
Uniform wrinkle, medium.



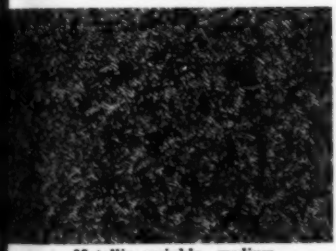
Uniform wrinkle, small.



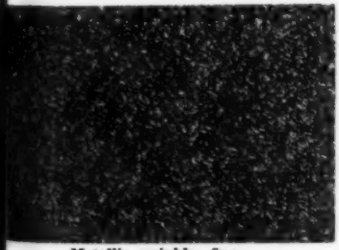
Pine tree wrinkle, medium.



Sag wrinkle, medium.



Metallic wrinkle, medium.



Metallic wrinkle, fine.

limitations. A heavy coat had to be sprayed on in order to produce wrinkling, and this coat would be soft and spongy unless it was baked for at least one hour at 350°F. But at this temperature, the clear wrinkle finish turned a dark brown. Only the black, dark and "dirty" colored finishes could be produced in wrinkle. The grain of the surface, though variable over a considerable range, was always somewhat coarse, due to the heavy body of the material.

New Type Wrinkle Finishes

The old wrinkle finishes typified by the sag wrinkle and pine tree wrinkle still have their uses, but one of the most interesting of recent developments in the finishing field is a new uniform type of wrinkle finish with greatly improved properties.

These new finishes are of low viscosity, so that they have greater covering power and can be applied with a uniformly fine grain, without glossy spots, "shiners," or "fish-eyes." Moreover, discoloration on baking has been so far reduced that pure white wrinkle finishes can now be had, as well as all light and pastel shades and, of course, dark colors.

These improvements have greatly extended the usefulness of wrinkle finishes. They offer, in fact, an unusual combination of attractiveness, wear-resistance and application economy.

Spray Conditions

Because of the low viscosity and quick-drying qualities of the new wrinkle finishes, extra care is necessary in order to get the best results.

Good coatings are obtained by applying light wet coats, using

air at pressures of from 8 to 10-lbs. for the fluid pressure, and 65 to 70-lbs. of air for atomization.

Complete atomization is possible with these finishes and it permits fine uniform work, but very coarse and heavy texture can be obtained if desired. Some of the different types of texture or grain obtainable are shown in the accompanying illustrations.

The pressure tanks should be equipped with air motors so that the material will be continuously agitated and uniform shades of color will be maintained. This is particularly important with wrinkle enamels containing metallic powder in suspension.

Effects of Standing

These quick-drying finishes pick up air rapidly and are altered by doing so, hence the quantities placed in the pressure tanks should not exceed a few hours supply.

If a skin forms on the surface of the material after the can has been opened, it should be removed by cutting along the edges and lifting it out in one piece. It is also advisable to strain the material through cheesecloth.

These finishing materials can be kept in sealed cans for several months without deterioration, but they may become heavier after aging due to the absorption of oxygen. If a skin is found on the material when the can is opened, it should be removed.

Baking; Quick and Slow-Drying Types

These new finishes can be supplied for air-drying, where baking facilities are not available; or for baking one hour at from 225° to 250°F. Higher temperatures should not be employed, as they tend to cause discoloration.

For products that are carried into the ovens by conveyor systems immediately after spraying, a quick-drying type of finish is supplied—and this type of finish should not be used when the product is to be left standing more than 10 or 15 minutes before baking. Slower-drying types that can stand an hour or more before being baked, are supplied when manufacturing conditions require them.

Character and Color Possibilities of Coating

After baking, the coating is very hard and wear-resisting. One coat is all that is needed to give good coverage if a single color effect is desired. Very attractive results can be obtained with bronze powders ground in the colored wrinkle enamel. A wide range of pleasing color combinations can be easily made by first finishing the object all over with one coat of wrinkle finish of suitable color, and then coating sections, stripes, bands, or designs in contrasting colors with quick-drying lacquer enamel or metallic luster lacquer, using a mask or stencil. By using this method, wrinkle finishes can be "dressed up" to any desired degree.

Touching Up Wrinkle Finish

The touching up or patching of scratches and spots that occur during assembly or handling in the shop always presented a problem in wrinkle finishes. If it is a scratch, use the same color that was originally applied and brush in a light coat with a camel hair or striping brush. If the damaged area is larger, feather edge the spot with fine sandpaper and ap-

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ply the same color, using a small touch-up gun. In either case heat the patched spot with a baking lamp or portable reflector-type radiant heater. This will eliminate rebaking the entire unit.

While wrinkle finishes are used chiefly for finishing iron and steel products, these finishes can be used on almost any kind of surface. With respect to the kind of product, the application of these finishes is virtually unlimited; they are already being applied to a wide variety of products. They promise to be very popular during the coming season, and product manufacturers who are not familiar with them should investigate their possibilities.

Chicago Furniture Show

So that the home furnishings industry may be fully informed, and bearing in mind that the Chicago Market has at all times considered the best interests of the buyer and manufacturer alike, a joint meeting of the managements of the American Furniture Mart and the Merchandise Mart was held November 9 and the following decision was announced:

The January 1939 market dates, as originally set by the Board of Governors on July 8, will be held as scheduled, for the two weeks beginning Monday, January 9, 1939, and running to January 21.

The two buildings announce that they have entered into no agreement, nor taken any official action to change the present four market system to two markets per year.

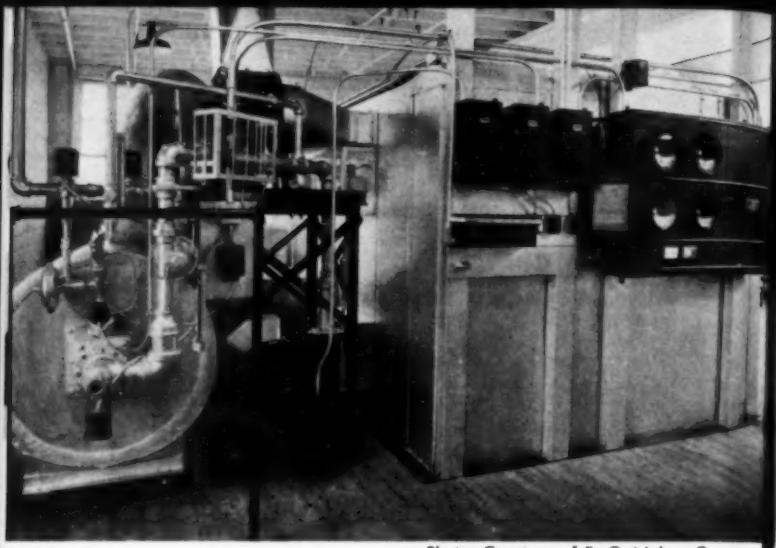
At the January meeting of the Board of Governors, to be held Friday, January 13, 1939, the dates for the July 1939 market will be set and full consideration will be given to the matter of May and November market dates.

Air Filter Research at Mellon Institute

Dr. Edward R. Weidlein, Director, Mellon Institute, Pittsburgh, has announced the establishment of an Industrial Fellowship in that institution by the American Air Filter Company, Inc., of Louisville, Ky. This Fellowship will investigate broadly materials of value in the construction of filters for air-conditioning systems. It will be the aim to gain through this research new knowledge to effect all possible improvements in the devices manufactured by the donor, and in this work the Fellowship will have the direct cooperation of specialists on the staff of the Multiple Industrial Fellowship on air hygiene in operation in the Institute.

Dr. Frank F. Rupert, who has been appointed to the incumbency of the Fellowship, has been a member of Mellon Institute since 1913 and has been associated with the Fellowship on air hygiene since 1935.

This ensemble is typical of the new Swedish Modern groupings featured during the fall market at the American Furniture Mart. It is made of bleached mahogany and has interesting case paneling on the bed and chair. The well appointed brass hardware lends a dignified note to the case pieces.



Photo, Courtesy of R. C. Mahon Co.

THE CAUSE AND PREVENTION OF *Oven Explosions*

BY. J. W. FARWELL
Engineer, American Mutual Liability Insurance Company

"WATCH OUT for that oven—it may explode." If a plant foreman issued that warning to his men working at an industrial oven, the chances are he would have no crew left. Yet, there are only two reasons why a conscientious foreman would not issue such a warning; either he would be not fully aware of the inherent explosive possibilities involved, or the oven would be completely controlled by modern automatic safeguards.

Experience shows that a potential explosion hazard exists in connection with all industrial ovens which either treat products giving off flammable thinner vapors, or use fuels for heating which comprise or produce gases capable of forming explosive mixtures.

Because of the chemical composition of many materials used in baking processes, it is a practical impossibility to prevent the by-product creation of flammable thinner vapors. Drying and finishing substances such as enamel, japan, lacquer, paint or varnish give off vapors of an explosive nature. This is also true of such items as asbestos products, impregnated armatures or coils, in-

sulation of wire, imitation leather, rubber or bakelite, linoleum and oilcloth, lithography, pyroxylin and coated papers. In the industrial oven these and similar items are constantly creating unavoidable explosion hazards . . . hence it is of extreme importance that recognized safeguards and precautionary methods be employed to prevent loss of life, injury, and damage to property.

Ventilation to Remove Flammable Vapors

One of the first and most essential safeguards is to provide proper ventilating equipment to insure that flammable vapors do not reach explosive concentration. Explosive concentration of air-gas mixtures depends upon the characteristics of each specific gas or vapor; and safe ventilation requires maintenance of dilution at less than concentration. In some small installations, where the temperature of no part of the oven is sufficiently high to ignite the vapor, natural ventilation may suffice. However, the amount of ventilation obtained by natural draft varies between wide limits, dependent on atmospheric conditions and operating oven temperatures. For that reason the power-driven blower is a much safer installation and is the only way of securing adequate and calculable ventilation. Therefore, except in the limited cases just mentioned, continuous blower ventilation, interlocked with heaters, should be provided.

In addition larger ovens should have a time-delay relay which closes the fuel valve or heater switch after a predetermined delay . . . . assuring a definite time interval before a heater or conveyor can be started. All ventilating of combustion chambers should be separate from the baking chambers if feasible.

The calculated ventilation needed for box-type ovens with intermittent loads is about 350-cu.ft. of air per minute at 70°F. for every gallon of thinner evaporated per oven charge. In conveyor-type ovens the rate of evaporation is more constant and the ventilation should be at least 9000-cu.ft. (at 70°F.) per gallon of evaporated thinner. The higher the temperature of the exhaust gases, the more ventilation is required. These figures are general only and will vary, depending upon the gas or vapor given off and the exact operating temperature of the oven.

Exhaust Ducts

Exhaust ducts from an oven should be so located that the maximum exhaust offtake capacity will be at the point where most of the thinner evaporation occurs. It is important to know that thinner evaporates at a much faster rate when the product is first put into the oven and also that thinner vapors are heavier than air—hence ducts should usually be at the bottom of the oven and so arranged that no gas pockets can form.

In the exhaust ducts there should be a vane-operated electrical interlock airflow switch which is held closed when the proper air flow is passing through the exhaust duct. This assures proper operation of the ventilating system before the heater or conveyor can be started. It also shuts down the heater or conveyor if the ventilation fails.

The second essential safeguard, as a means of minimizing danger

and disruption should an explosion occur, is to equip ovens with explosion vents, doors, or relief heads as pressure-relief. The minimum effective vent area is 1-sq.ft. for 15-cu.ft. of oven volume. In lightly constructed ovens it is sometimes possible to leave the entire roof unfastened. In other cases the loading doors are the only available vents. If the doors are also to serve as vents, they should have no latches to prevent their opening when pressure is applied from the inside.

Minimizing Hazards from Gas-Producing Fuels

The principal means of heating ovens are by convected or preheated air, electricity, gas, oil, steam, coal, and coke. Electricity and steam offer no direct hazard . . . . convected air does not present an inherent hazard, but indirectly hazards may exist, depending upon the method used for heating air. Burning coal and coke may give off gases (incomplete combustion) which will form explosive mixtures under certain conditions. Fuel gas and oil heat present the most potential hazard, and safeguards must be provided to prevent the concentration of explosive mixtures of gases from this source.

The application of safeguards varies with the size, type and use of the oven, but in general, the combustion chambers should all be equipped with adequate ventilation interlocked with the burners by means of an air-flow switch and with a time-delay relay (if oven is sufficiently large) to insure the dissipation of gases which may have collected before burners can be lighted. If the oven proper is in direct communication with combustion chamber or burners, a door switch should make it necessary that the door be opened wide before the burners can be lighted.

Automatic Gas Shut-off

All ovens using gas as a fuel should also have some type of combustion safeguard to shut off the gas supply to the burners should the burner flame be extinguished and thus prevent the unburned gas from entering a furnace or heater where it could form an explosive mixture with air.

The safety pilot is the most common type of this safeguard. It shuts off the gas supply when the pilot burner is extinguished. This may be done either by a valve which is an integral part of the safety pilot or by a separate electric or pressure-operated valve. The supply to the pilot burners should also shut off automatically.

A typical electric safety pilot includes a heat-sensitive element exposed to pilot flame. This element responds to presence or absence of flame and actuates a small switch through a system of levers and a friction clutch. When the pilot flame is lighted, the switch contacts close, which in turn opens the main gas valve. When pilot fails, main valve shuts automatically within five seconds.

Should it be desired to restrict ventilation after the burner is lighted, the addition of a pressure switch to the gas supply in either of the above arrangements will permit such restriction.

Other Safeguards to be Taken

In addition to the automatic safeguards described above there are other measures which should

WRINKLE *Finishes*

IN our 70F-1 FINE BLACK and 70F-2 COARSE BLACK WRINKLE FINISHES we offer two materials of the very highest quality. A high gloss and jet-blackness of color are now possible with these materials.

To insure uniform results they are shipped ready for use. They are intended for spray application without reduction and should be baked for two hours at 250° F. They are unaffected by air drying for a reasonable time before baking.

They produce, in a single coat, an extremely attractive and economical finish having good hardness and adhesion.

(Licensed by New Wrinkle, Inc.)

THE STANLEY CHEMICAL CO.

EAST BERLIN, CONN.

LACQUERS - SYNTHETICS - ENAMELS - JAPANS

A Subsidiary of THE STANLEY WORKS, NEW BRITAIN, CONN.

be taken to insure the safe operation of the industrial oven. First, all installations should be of noncombustible construction throughout. Second, the interior surfaces of the oven should be as smooth as possible to facilitate good housekeeping. Third, the oven should be isolated in so far as consistent with production. Fourth, a competent experienced operated should be in charge of operations.

In some cases owners have argued against some of the safety factors recommended here. The installation of adequate ventilation, they say would seriously impair the efficiency of the oven. However, modern heating and ventilating engineers have found it possible to satisfy this condition. Again, it has been claimed that the application of safety controls would interfere with normal operations. But, it has been possible to install these controls without imposing operating hardships .... in fact, in some cases, easier operation has resulted. Another objection was that oven doors used as explosion vents constituted, by suddenly opening under internal pressure, a serious hazard for men working in the immediate proximity. This possibility is, of course, more than offset should there be an explosion when there were no adequate explosion vents. Then, many more than those close by would be endangered.

Reprinted from Oct. 1938 issue of American Mutual Magazine. Statistical information: Associated Factory Mutuals.

Air Line Respirator

The new M. S. A. air line respirator is described in bulletin CS-7 just released by the Mine Safety Appliances Co., Braddock, Thomas & Meade Sts., Pittsburgh, Pa. Double exhalation valves are a special feature of this respirator, providing very low resistance to air flow. Many other advantages are listed for the reader's information.

Modern Plastics Handbook

For the third consecutive year, the October issue of Modern Plastics Magazine appeared as a Handbook-Catalog-Directory Number, revised and brought uptodate, making an easy reference manual of all major developments in materials and methods, machinery and equipment, that occurred during the past 12 months.

A survey of the advancement of plastics production and fabrication in England, France, Germany, Italy and Australia, as well as a comprehensive report of plastic development in this country by Dr. V. D. Reed of the U. S. Bureau of Census, along with 46 illustrated articles, was included in this issue.

The Properties Chart, which reflects the cooperative effort of chemists and engineers in more than 50 manufacturing plants where plastic materials are made, offers the widest possible comparison between the various types of plastic materials in the American market.

The Trade Directory, one of the most valuable references in the industry, has been brought uptodate, and includes listings, with complete addresses, of machinery, equipment and suppliers, custom molders, fabricators and designers, molder's markings, trade names, chemicals and raw materials.

WOOD LACQUERS

There are no spectacular developments in wood lacquers. There is, however, the accumulation of years of testing and steady improvement resulting in our present line of gloss and flat lacquers developed for the wood working industries.

Where the maximum dollar value in solids and smooth-flowing solvents is required; where perfected resistance to cold-checking, abrasion, moisture, printing, beverages and light are desired, we shall be more than glad to submit samples for any desired test.

Within the comparatively narrow price range for this type of lacquer, we feel we can and do supply a material unsurpassed for its specific purpose.

THE VARNISH PRODUCTS CO.

5208 Harvard Avenue Cleveland, Ohio

SILK SCREEN METHODS of REPRODUCTION

THIS new book is intended for Sign Painters, Card Writers, Display Men, Furniture Manufacturers, Novelty Manufacturers, Glass Etchers and For Domestic Use.

Every detail of the silk screen process is presented clearly in detail. All equipment is fully described and its use illustrated. All materials needed in the various kinds of silk screen work are mentioned with respect to their use to advantage. Estimates of costs and prices to charge are given.

Fully Illustrated by the Author. Leatherette Binding. Size 5x7½ in. 193 Pages. 98 Illus...... $3.00

Practical Publications, Inc.

222 East Ohio Street Indianapolis, Ind.

Conveyorized Three-Dip Degreaser

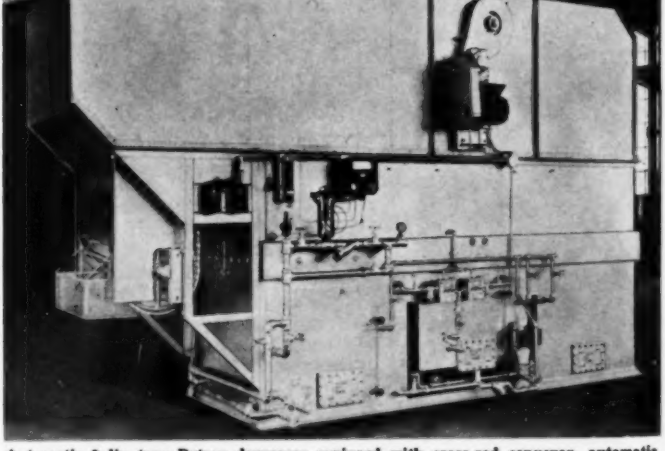
New...

MATERIALS SUPPLIES EQUIPMENT

A new conveyorized 3-dip degreasing machine is announced by the Detroit Rex Products Co., Detroit, Mich. This machine is used to remove oil, grease and dirt from all kinds of work, such as stampings, castings and screw-machine products prior to painting.

The sequence of cleaning operations, which are performed automatically after the basket of work is hung on the cross rod of the conveyor chain, is: Immersion in boiling solvent, immersion in clean solvent rinse, and final cleaning and drying in pure solvent vapors. The metal parts or assembled products are cleaned with stabilized non-inflammable, non-explosive safety solvents—either Perm-A-Clor or Triad. They are immediately ready for finishing without any scrubbing or extra dryoff.

While this design of machine is built in several standard sizes, the particular unit shown accommodates work up to 36-in. long, 15-in. wide, 15-in. deep and 20-in. hanging. The approximate overall dimensions of the degreaser are: Length, 12-ft.; width, 6½-ft; height, 10-ft. It has a total solvent capacity of 250 gallons, and the approximate weight is 6300-lbs.



Automatic 3-dip type Detrex degreaser equipped with cross-rod conveyor, automatic control and arranged for loading and unloading at one end.

At a normal conveyor speed of 6-ft. per minute, the rated production cleaning capacity is 2,000-lbs. of work per hour. The minimum production rate is one basket per minute; maximum, three baskets per minute.

This automatic machine is equipped with a return-type cross-rod conveyor designed to load and unload at one end and with return flight of conveyor in upper hood. Cross-rods, from which baskets of work are hung, are spaced at regular intervals along the 2-strand conveyor chain. The ¾-hp. motor drive, speed reducer, and variable-speed are mounted on the upper hood, and drive the conveyor chain through a "through-shaft" and drive sprockets. A conveyor chain take-up device is located on sprockets at entrance-exit end. Oilless bearings are used on all sprockets inside the vapor zone.

The degreaser is fabricated from steel plate, reinforced with structural steel and is of all-welded construction. The inside is spray-coated with hot zinc after fabrication.

This machine is equipped with safety steam pressure relief valve and an air-operated, vapor-actuated temperature indicator and steam control, complete with air filter and pressure reducer, by-pass piping, hand valves, strainer, and steam pressure gauge. It is also equipped with a motor-operated solvent transfer pump to return distillate from the third or vapor chamber to the first or boiling chamber. This pump can also be used to transfer solvent into or out of the machine and between any of the chambers. Each of the three chambers (boiling chamber, clean solvent rinse, and vapor chamber) are equipped with removable cleanout doors. The upper hood is fabricated of galvanized steel reinforced with structural steel of welded and riveted construction. There is a skylight on top of the hood and a large access door in the back.

Kauri-Butanol Solution

An announcement from the Stewart Research Laboratory, 315 22nd St., N. W., Washington, D. C., states that:

"We offer to the trade the following scientific specialty for use in making solvent power tests (solvency) on petroleum hydrocarbons such as mineral spirits, V. M. & P. naphtha and lacquer diluents. This material has been standardized in accordance with the various Production Club methods. This brand of Kauri-Butanol Solution brings to technicians in different laboratories the assurance that everyone can use a uniform and strictly comparable reagent. Being ready to use, it simplifies the preparation for the test, and its use thereby results in a great economy of time and money."

Extension Handle for Spray Gun

A new type extension handle which adapts the company's heavy-duty high-speed MBC gun to extension spray painting work is announced by The DeVilbiss Co., Toledo, Ohio. The handle is designed specially to combine the convenience of an extension gun in many classes of contracting, railroad and industrial painting with the higher quality of work done by the standard MBC gun.

The extension is light in weight and properly balanced. Location and construction of the trigger are such as to make operation as simple as with the gun itself.

Nozzle of the gun is tilted at a 40° angle from the line of the han-

dle. This facilitates spray-coating of walls, ceilings, structural work and maintenance jobs which are difficult with a gun alone.

The extension is rigidly constructed of air and fluid tubes, held by clamps and soldered into a strong casting at the inlet end. Extension trigger is attached to this casting, and operates the gun by a simple ball crank system.

The new handle has the same combination of air and fluid connections as are available on the MBC gun, and may be attached or removed in a few moments. Standard lengths are 3, 4, 5, 6, 8 and 10-ft. The 8 and 10-ft. lengths are specially reinforced.

Lac-O-Var

Lac-O-Var, a new wood finishing material developed by the Advance Paint Co., Indianapolis, Ind., has the speed of lacquer and the body of a varnish. It is supplied ready to spray and is so constructed that it has all of the qualities of the high-type final finishing coat for all types of wood furniture. It should be sprayed in the same manner as a lacquer and dries as fast as lacquer, but the ultimate result is a varnish body with the appearance of a rubbed-like varnish finish.

Lac-O-Var should be used over lacquer sealer or O-Shelac. One coat of sealer or O-Shelac and one coat of Lac-O-Var, over a stained or filled job, makes a very nice finish. It can be rubbed with pumice stone and oil in three to four hours after application.

Sealer Extension Spray Gun

The Thor Model No. 7-H sealer extension gun, offered by Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill., is designed primarily for applying sealer to body seams on the under

Extension nozzles, 4 to 10-in. available.

side of automobile bodies to prevent dust from entering the car body through open cracks. On the upper body joints a ribbon of sealer is laid on the seam. Such a ribbon cannot be laid up against an underbody joint. The sealer must be sprayed up on to it. The spray nozzle is held about 6 to 8-in. below the seam and sprays a pattern 2-in. to 3-in. wide, doing a thorough job.

This type of spray gun is also ideal for sealing body seams in other places. It is used, for instance, to seal the cowl wells (weather proofing) where they are joined to the body proper. It also has a wide application in other fields where it is an advantage to spray a sealer instead of flowing it.

Compresed Air Filter

For cleaning the compressed air in a pipe line of moisture, oil, sediment and other foreign matter, the Fisher Governor Co., Marshalltown, Iowa, announces two new filters one of which is illustrated in the cross-sectional view herewith. The body of the filter is made of iron, but the inner cylinder of Type 361 filter is brass. Adequate air passage is provided into the inner cylinder by means of numerous passage holes in the lower part of the cylinder.

The filter element is a specially manufactured stone—a hard homogeneous and uniformly porous material made of extreme hard aluminum oxide crystals bonded together by acid-resisting bonding medium. This filter element is a highly porous

Industrial FINISHING

. . . an outstanding

Editorial Feature

Again, INDUSTRIAL FINISHING magazine prepares for its big Annual Review Edition—to be issued in January, 1939. Twenty or more pages will be reserved to present, in regular editorial form, the developments and improvements in finishes that have taken place during 1938.

1935, 1936, 1937, 1938, and NOW . . . 1939 bigger and better than all. We couldn't render a greater editorial service to readers of INDUSTRIAL FINISHING than this. It arouses genuine reader interest and stimulates inquiries to a surprising degree.

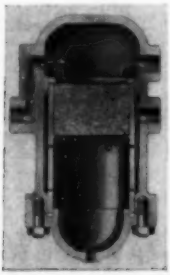
Advertising Value, Too

Finally, there is afforded the opportunity to tie right in with this editorial feature . . . an attractive, sales-stimulating story about finishes, or finishing equipment, can be presented in a full-page, half-page or quarter-page advertisement, as best fits the situation.

What better way than this to start the New Year, to gain wider recognition for finishes, or equipment; to supplement the efforts of sales and service men in overcoming sales resistances; and lastly, to uncover new markets here and there, perhaps existing right within a radius of 100 miles of your plant! Arrange NOW for liberal space.

Don't Miss This BIG 1939 Review

structure. A multitude of pores extend from one surface of the plate or cup to the opposite surface, yet these pores are of an extremely tortuous nature. This combined property permits compressed air to pass through the structure in large volume but with slight frictional resistance. At the same time any material, such as dirt, moisture, oil or sediment carried in suspension, is prevented from passing.



Cross-sectional view of No. 361 filter.

Dens-Ox-Cide
(Rust Preventative)

Dens-Ox-Cide is a thin liquid material for use in covering rusted surfaces or surfaces likely to become rusty (interior or exterior) to prevent further rusting.

It is a scientific blend (by special heat treatment) of deodorized refined fish oils, with Densol rubber-base liquid, which greatly enhances the inherent qualities of these materials and gives them remarkable rust inhibitive properties. The liquid thoroughly penetrates through the rust to the sound metal and surrounds every particle of rust, cementing and binding these particles into a permanent impervious moisture-proof elastic coating which prevents further electrolytic action.

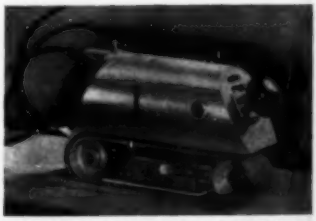
When used as a primer or where the surface is only slightly rusty, the material is thinned 10% to 25% with mineral spirits and is applied only as a thin film.

In addition to its rust-preventative qualities, Dens-Ox-Cide possesses exceptional heat-resisting qualities which make it adaptable for exterior exposures such as on metal stacks where maximum elasticity of the coating is required to meet sudden and drastic changes in the temperature of the surface to which it is applied. It is also an unusual vehicle for aluminum powder and for thinning red lead paste.

This material is a product of The Densol Paint Co., South Park, Ohio.

Portable Sander

A small portable belt sander that takes power from any 110-volt electric light circuit, is announced by the Syracuse Guild Tool Co., Syracuse, N. Y. The abrasive belt is 2-in. wide, 21-in. in length and travels 600-ft. per minute. It can be removed and replaced quickly by means of a patented catch-and-release spring plate.



GuildSander, Type A-2; Wt., 9-lbs.

The streamlined metal body of the machine is made of die-cast aluminum and finished in baked aluminum enamel. This machine can be used on flat surfaces and on some curved surfaces. Its front pulley may be used singly as a spindle sander.

DEPENDABLE ADHESIVE TAPES FOR INDUSTRIAL PURPOSES

PERMACEL
THE PAPER MASKING TAPE
JONFLEX
FINE CLOTH MASKING TAPE
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IN RANGE OF COLORS
ALL TAPES ¼" TO 36" WIDE IN 60-YD. ROLLS

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INDUSTRIAL TAPE CORPORATION
NEW BRUNSWICK, N. J.

Schaefer's MAR PROOF LACQUER

Send for working samples

try to scratch or mar it!

Here is a lacquer finish that cannot be marred or scratched with the thumbnail, or other destructive agencies—a much tougher piece of goods than the ordinary lacquers. It produces a splendid transparent finish of full depth on maple, walnut, gum, mahogany and other cabinet woods....It is made in either the Clear Gloss Rubbing or the Satin Finish. Mar Proof Lacquer Sealer is recommended for first coat.

THE SCHAEFER VARNISH COMPANY, INC.
Louisville, Kentucky

To Dissolve Acetate Scrap

We have occasion to dissolve acetate scrap in acetone and find that it takes almost two weeks before the scrap is thoroughly dissolved. We do not know whether acetone is the best solvent for it. Perhaps there may be another process of which we know nothing about. It seems that mechanical mixing does not help much.—B. Mfg. Co.

Our technical experts advise us that C. P. (commercially pure) acetone is the best and cheapest solvent for acetate. The fact that the acetate scrap you have requires such a long time to dissolve is probably due to the fact that it has been improperly treated before you received it. If convenient, we suggest that you send us a sample of this acetate scrap for examination. We may be able to give you more specific information then.—EDITOR.

Turned Handles

We have a finishing problem and would appreciate your help. The article is a turned wood handle (¾x8-in.) used on toy scooters. At the present time we are using a lacquer primer which is applied by tumbling. This is followed by a coat of black lacquer, sprayed on. Our rate of production is too low and our material waste is too high. We feel that both troubles can be eliminated—but how?—G. F. Co.

I notice that you are tumbling a primer or sealer coat on the handles. This is commendable practice on pieces of this shape, and I wonder that you do not tumble the finish coat also. Perhaps you have tried this and have not found it possible to produce the exact effect you want. Have you tried staining the handles black by a basket dip operation and following by a tumbled clear coat, which could then be polished by further tumbling with shavings, leather scraps, pieces of newsprint or bits of pressed felt?

Tumbling is an operation which often requires considerable experimenting to achieve the exact result desired. So much for the tumbling. I believe it has possibilities for your type of work, but since you have probably given it a trial for your present job, may I make another more specific suggestion?

The most common method of applying a coating on handles for screw drivers, kitchen tools, etc., is by dipping. Wooden fish lures, such as bass plugs, are finished in this way. Dipping machines make a splendid job of such articles when the volume of production justifies their use. Much of this dipping is done by hand. I am sending you four pieces that have been finished by hand dipping. All are 2-coat finishes bearing the materials indicated on the attached tags. Only two materials were used on the four pieces, a clear and a black, both air-drying lacquer products.

Questions Answers

THE VERY LATEST COLORS IN LIGHTER THAN NATURAL WOOD EFFECTS FOR

ORIENTAL WOODS AND SWEDISH MAHOGANY

WOOD BLEACH

READ what a prominent manufacturer says about Gilco 2-in-1 Odorless Wood Bleach: "We have tried a great number of Bleaches and have found your Gilco Odorless Wood Bleach superior to any of the various products we have tried."

STAINS FILLERS

The latest developments of our laboratories, which are indispensable for the satisfactory attainment of these beautiful, new, light colors destined to be the most popular of the coming season.

FINISH COATS

The Water White film produced with L-140 Pale Rubbing and Polishing Lacquer or LV-541 Pale Varnish used over L-240 Water White Lacquer Sealer.

Have you a finishing problem?
Write us today.

THE GILBERT SPRUANCE CO.

Specialists in the manufacture of Wood and Metal Finishing Products

RICHMOND AND TIOGA STREETS
PHILADELPHIA, PA.

SPRUANCE QUALITY

The lawn mower handle is chosen as being similar in shape to your handle. The finishing method is as follows: A small nail or pin is stuck into one end, and the piece is immersed in clear lacquer and withdrawn immediately. It is allowed to hang with the lower end a scant ¼-in. from the surface of the lacquer in which it was dipped, for about 15 minutes, or until the drop on the end becomes constant and motionless. The theory of this is that the vapor from the surface of the lacquer keeps the adjacent part soft until the drip has flowed down to a minimum drop. When the drop stops sagging, lift the piece and touch the drop with a soft brush, rag or an absorbent paper towel. The result will be . . . no visible drop or nib on the end.

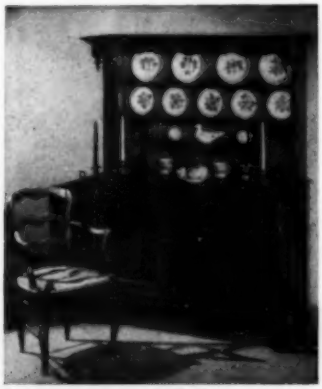
After about an hour's drying, the piece is dipped again, this time in the black lacquer, and *from the reverse end.* The reason for the reversal is obvious. In such a dip operation the flow of material will tend to produce a thicker coat at the lower end of the piece than at the top. The reversal, in a 2-coat finish, compensates for this tendency. After about two hours of drying, the pieces should be ready to handle for assembly, although perhaps they should not be packed until the following day. On removal of the final nail or pin from the end there may be a very small hole remaining which can be pressed shut with the finger while the final coat is still soft, or a small quantity of black wax might be pressed into the hole.

By way of variation, the small pointed handles for kitchen utensil have been finished with the black on first and the clear as a top coat. All of the pieces are birch.

I believe this would be most satisfactory, best appearing and most economical finish you could apply in two coats. The materials might be somewhat more expensive, gallon for gallon, but there is no waste and a minimum of handling.

The pieces could be hung on a rack over a dip tank and then dipped singly by hand or simultaneously by lowering the rack. After draining for about 15 minutes, the rack may be removed and set up for drying, at which time the tips would be touched to remove the final bead. The tack, nail or pin in the end for suspension might be in the form of an upholsterer's gimp tack, and could be driven in quickly by using a magnetic tack hammer as an upholsterer does.

The matter of maintaining the



A grouping of new Provincial furniture fashioned of mellowed cherrywood in a rich, hand-rubbed Provincial finish. Authentic hardware and hand-woven rush chair seats add to the charm of the new ensemble. American Furn. Mart, Chicago.

WE SPECIALIZE IN *Versatility*

A complete line of Egyptian Finishing Products for all requirements is available to the industrial finishing market . . . Lacquers . . . Synthetics . . . Varnishes and Paints. All formulated to do a specific job in the fields to which they are offered.

All kinds of metal products, furniture, paper, glass, fibre, leather and rubber are better finished with one or another of the many materials comprising the Egyptian Line of Industrial Finishes.

In addition to finishes for what may be termed standard needs, there are also Egyptian Finishes in novelty effects and for "hard to finish" products.

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proper density in a dip tank need not be complicated or involve any special apparatus. Keep a sample of the dip lacquer at hand in a tightly closed vessel as a standard. Take a piece of molding, a dowl, or other stick of uniform size and shape throughout its length and cut it in two, so you will have two sticks alike. Make a mark, or cut a notch 2-in. from the end of each. Dip the sticks simultaneously—one into the dip tank and the other into the container of "normal standard" material, dipping each to the mark, that is each to the same depth. Lift them out of the lacquer at the same time and observe the flow of the materials from the ends of the sticks. Add thinner to the dip tank as required until the flow of the lacquer, as shown by its behavior on the stick, is the same as that in the retained normal sample.

I might add, in reference to dip tanks, that it is often the custom to make the rack used for carrying the pieces to be dipped, so it will serve as a sort of lid to the tank—so that while the pieces are draining, there will be no evaporation from the surface of the lacquer. Not only is the thickening of the lacquer retarded, but the resulting concentration of vapor will aid in the flow and in minimizing the tip or bead at the lower end of the piece.—W. T. SMITH.

Excessive Dryness in Wood Finishing

We are faced with a problem regarding relative humidity in our finishing department. Due to the high temperature in the fin-

ishing department we find that during certain seasons, especially in the fall and winter, we have excessive dryness. We have not been able to properly correct this by use of open pans of water or steam jets from steam lines. Would you please suggest a practical method of raising the relative humidity in our finishing department and maintaining it as closely as possible at a steady percentage.

Our trouble is the checking and splitting of the wood which, as nearly as we can trace, comes from drying out in the mill or in the finishing department, due to lower humidity in certain sections of those departments. The kiln drying percentage has been carefully checked.

We try to maintain approximately the same relative humidity in the millroom as in the finishing department, although the former is located on the first floor while the finishing department is on the second floor.—R. M. Mfg. Co.

It is difficult to make specific recommendations without knowledge of the species of wood you use, your exact kiln drying practice and facilities, and the handling of the lumber with regard to storage, resawing, etc. You state that your trouble is with checking, and that you feel that the cause is low humidity in the departments mentioned.

Frankly, it is difficult to conceive of a room in which men work being sufficiently dry to cause checking of properly conditioned lumber. Have you checked the actual relative humidity in the rooms where the trouble occurs? If not, I suggest that you do so, using a hygrometer (wet

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and dry bulb thermometers) or, more accurately, a sling psychometer. If the temperature of the rooms is not over 100°F., and if the relative humidity is not less than 40%, the condition of the factory rooms is definitely not your trouble. Probably the trouble lies in the kiln drying of your lumber. Lumber that emerges from the kilns in a stress-free condition and is properly aged or "tempered," will not check under normal interior conditions.

Do you make resaw tests of the test pieces from your drying process to observe the stress condition of the wood during the drying schedule? This is important, because it is the only means possible for determinating what is going on inside the piece. It was my privilege, some time ago, to take charge of the millroom and kilns of a plant using a great deal of 3-in. lumber, some of it red gum, for the manufacture of small parts, necessitating resawing of all this heavy stock. They had a modern drying plant operated by a man of long experience, but they were experiencing a great deal of the same sort of thing of which you complain. We found all of the trouble in the operation of the kilns. After taking steps to produce stress-free lumber in the kilns, checking became an unknown condition in that shop.

I assume that you are drying your lumber to about 5% or 6% moisture content. Take a dried board and cut ¼-in. length from it, at some point more than 3-in. from the end, lay it flat and, starting from one end, make a series of saw cuts about ¼-in. apart through to a point a short distance from the other end. These saw kerfs should remain exactly as they are cut, without pinching in or spreading out. If the saw kerf pinches the saw, the piece is case-hardened; the outside is set by too rapid surface drying, the interior has an expansion stress and the outside is in tension. If the saw kerf opens, spreading into a Y, the piece is reverse case-hardened; the outer surface is in tension and the interior has an expansion stress.

Do you sometimes deliver lumber to the rough mill while it is still warm from the kilns? Kiln-dried lumber should, on removal from the kilns, be "tempered" in dry storage, at normal atmospheric conditions, but with a free circulation of air, for a week or more to permit it to adjust itself to normal atmosphere.

You ask for a practical means

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IMPERVIOUS VARNISH COMPANY, KOPPERS BUILDING, PITTSBURGH, PA.

of raising the humidity of your mill and finishing rooms. I'm sure that either of the systems you mention should be adequate to maintain a satisfactory condition for woodworking, if the wood is in a stable condition. Take accurate readings on the humidity, and if it is around 40% or 50%, which it probably will be, you must look elsewhere for your trouble. It is an excellent idea to test the effect of the workroom's atmosphere on your wood as follows:

Take a small representative sample of the lumber, cut off a board to a length of not more than ½-in., and dry it to bone-dryness in your test oven. Leave it 24 hours in your dry storage shed and weigh it again, observing the moisture it has taken on. Carry the piece through the shop, from one room to the next, leaving it 24 to 48 hours in each, and check the moisture content at each point. Further, you may also take a test piece of normal dry condition, weigh it and leave it in the rooms where the trouble occurs, and see just how much moisture it does assume. If the wood is in a stress-free condition, the moisture content may vary from 2% to 3% to as high as 12% or 15% without any harm whatever.—W. T. SMITH.

"New Wrinkles in Finishing"

New Wrinkle, Inc., Dayton, Ohio, has recently published the second issue of NEW WRINKLES IN FINISHING—a magazine dealing exclusively with the possibilities of Wrinkle Finish and its sales influence on consumer products of every description. It proves conclusively the merits of New Wrinkle as a one-coat finish which produces striking effects at maximum finishing economy, with a desirable influence on production costs. Industrial finishers are invited to write to New Wrinkle, Inc., Dayton, for a copy of the current issue.

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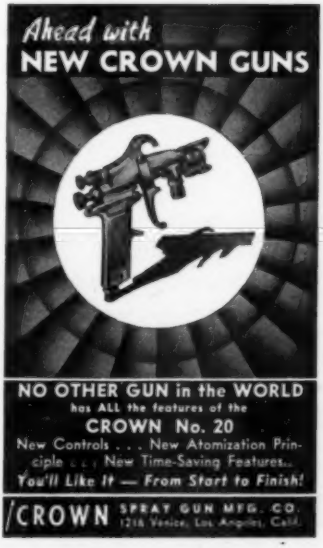
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Finishing Airplane Motors and Interiors

(Continued from page 13)

The problem was to develop a material that would have exceptional adhesive properties, be lighter than glue, have acoustical properties, and be resistant to water, heat and fire. It was developed and tested in the following manner:

Testing the S. P. Adhesive

Half of a structure used for testing materials of various kinds was sound-proofed by cementing the sound-proofing material with this newly developed material, and the other half by cementing the same material in place with the conventional glue or adhesive then in use. The materials were left in the test section for 72 hours, during which time the temperature reached 97°F. during the day, but they were subjected to heavy fogs and dampness at night. At the end of this period the engineers in charge attempted to remove the sections cemented in with the newly developed material and found it impossible to do so unless a sharp tool was inserted under the sound-proofing material to cut the adhesive away from the metal. The other side, fastened or cemented with conventional adhesive, pulled off with little or no effort.

This new adhesive material can be applied with either a brush or spray gun. However, in using a spray gun, it was necessary to develop a special wash-up thinner for cleaning the gun, hose and container. The wash-up thinner is also used to remove gobs or spray dust from the different parts of the metal which it unavoidably contacts during its application.

The weight of the material is 9½-lbs. per gallon against approximately 11¾-lbs. per gallon for conventional adhesives, which means considerable to airplane manufacturers.

Specialty Coatings Developed

There is a constant demand and wide field for the development of specialty "paint products" in the aircraft industry. A nitrocellulose specialty for coating aluminum and aluminum alloy sheets before fabrication, to prevent marring or scratching of the sheets has been developed by Southern California manufacturers. Incidentally this product should have a wide range of uses outside the airplane industry.

No. 711 METAL PRIMER Air Drying

—as an undercoat for either Lacquer or Synthetic Enamels.

Inquiries from interested manufacturers of metal products, invited.

H. V. WALKER CO., Elizabeth, N. J.

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The material is tinted a light blue for inspection purposes, is flexible enough to withstand the bending and twisting and pounding of hammers and presses, and it can be washed off with lacquer thinner after the 'plane is fabricated.

A material for coating jigs, fixtures and castings, preparatory to layout operations, has been developed and is used extensively in this industry. The material has a purple blue cast, drys almost immediately upon application, and will not roll under a scriber. It has the toughness and flexibility necessary to withstand the handling and rough treatment that castings and other parts are subjected to during fabrication. This material also has possibilities in fields other than the airplane industry.

Fluorescent Lighting Fixtures

The Miller Co., Meriden, Conn., has just introduced fluorescent lighting reflectors for use with the new fluorescent mazda lamps. Experts believe that these new light sources will revolutionize commercial and industrial lighting due to the many unique advantages they bring to the illumination of stores, offices and factories. The new fluorescent mazda lamps give several times as much light as ordinary lamps of the same wattage, thus providing high efficiency lighting without increasing current cost.

The daylight fluorescent lamp offers the closest approach to real daylight ever produced at high efficiency. It gives several times more light than the ordinary mazda lamp of the same wattage. Miller fluorescent lighting reflectors make all these advantages available in a compact form that has amazing possibilities wherever daylight lighting is wanted.

A new 12-page illustrated bulletin gives further information about fluorescent lighting fixtures.

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EDITORIAL

New Furniture Styles and Finishes

The latest dress rehearsal of Swedish modern, as staged at the American Furniture Mart's fall national home furnishings show, Oct. 31 to Nov. 5, gave evidence that the producers are satisfied with its performance and are in accord that it continue to hold the starring role. The only visible changes were concentrated in improved hardware on case pieces, and new upholstery fabrics.

Little change was made in the finish on the Swedish modern groupings. A medium tone, a compromise between the light and dark finishes, is now being accepted as more or less standard. Noteworthy exceptions were several suites in a conventional dark finish which further emphasized the versatility of the style in adapting itself gracefully to light or dark finishes.

Changes in the hardware were made both in the finish and the form. Satin-finished, silver-colored pulls, believed to harmonize better with chromium accessories, were substituted for some of the brass hardware used during the past season. Many suites had hardware especially designed to blend with the contour of the case, and in some instances manufacturers were given exclusive use of especially designed hardware for six month periods.

Cane trimming, used as panels on beds, china cabinets and chair backs has been established as an accepted part of the new Swedish modern trend. In most instances, the caning was finished in the same tone as the cabinet wood.

An interesting new trend was the use of bas-relief type carvings, in various forms, on case pieces, the ornamentation ranging from small carved medallions to grooved panels on case pieces.

Peasant interpretations of the Swedish vogue held second place in the style spotlight as various types of case goods featured provincial styles interpreted in oak, maple, birch and cherry, decorated with painted Swedish motifs, carvings and rustic details.

Eighteenth Century pieces offered very little change, the trend toward simpler lines still absorbing the attention of the manufacturers.

Colonial and Early American

* * * INDUSTRIAL FINISHING wishes all of its friends a Merry Christmas and a very Happy Prosperous New Year

styles appeared to be gaining impetus, the trend toward American designs apparently growing on the part of the American public.

Modern styles have been moved back to second place, and are now being shown extensively by volume houses. Conservative, simple, contemporary styles in the upper brackets, have been renamed by adherents of the Swedish vogue, though its modern heritage is easily noted by seasoned observers.

Latest developments, which indicate possible future trends, include absence of hardware on some of the bedroom cases. Grooved edges and hollowed slots beneath the drawers were provided to facilitate opening of the drawers.

Special finishes resembling black lacquered finishes were shown on some high-style pieces. A new "piano" finish on mahogany and a painted finish on maple was shown. Gold was used as the trim.—American Furniture Mart News Release.

Make Your Plant Safe from Fire

The experience of many industrial companies with long records of low annual fire losses shows that *the first line of defense against fire in every industrial plant should be formed by the regular workers armed with hand fire extinguishers.*

This defense line is, of course, never the sole reliance. Others, according to common practice, include: large extinguishers on wheels, which are brought to the fire by special squads; hose lines, also handled by special squads; automatic sprinkler systems; and, finally, the municipal fire department.

But in many respects, the workers' line of fire defense is the most important of all. Most fires start as small ones that can be readily extinguished without material damage by properly equipped and trained workers on the spot; whereas, when a fire is allowed to gain headway, even though it may be soon subdued by hose streams and sprinklers, the total damage caused may be very large. Hence, *the secret of consistently low fire-and-water losses is "every man in the plant a fire fighter."*

This system of fire protection applies equally well to large and to small plants and is desirable in both. To organize it, the following steps must be taken by management:

1) Install in the plant, where they will be readily accessible to the workers, a sufficient number of the right type of approved fire extinguishers to safeguard every fire hazard in the plant, under working-hour conditions.

2) Train all male workers in the proper use of the extinguishers by means of regular extinguisher drills, so that everyone will know what to do when fire breaks out.

3) Inspect the fire extinguishers frequently to make sure that

they are always in good working condition, and recharge them, when necessary, according to manufacturer's instructions, using recharging materials supplied by the extinguisher manufacturer.

4) See that watchmen are given special training in fire extinguishment and provide them with equipment that will enable them to cope with fires single-handed. For this purpose, the large wheeled-type of extinguishers are often useful. — Newark Safety Council.

Annual Review Issue Scheduled Next Month

A review of new materials for the conditioning, surface preservation, decorating and polishing of products made of wood, metal and various compositions will be presented in a feature article to appear in January issue. Many new items heretofore unpublished will be described and classified according to the type of work for which they are most suitable.

This Annual Review section has been a regular feature of the January issue of INDUSTRIAL FINISHING for several years. It has proved to be both interesting and valuable to all readers of the publication, and January copies are kept on file for frequent reference throughout following months of the year.

Every user of materials, supplies and equipment having anything to do with product finishing is interested in new developments that have passed the laboratory stage and have been proved by tests to be all that is claimed for them. Materials that 1) produce coatings of greater adhesion and durability under more severe service conditions, 2) offer new and striking decorative effects, 3) permit more rapid finishing schedules, 4) can be applied with less labor and cost, 5) overcome difficulties and troubles formerly encountered—these and many others are among those to be listed in the January 1939 Review.

These features, along with the practical and original articles on modern finishing methods, Letters from Readers, and an increased number of display advertisements will make the January 1939 issue of INDUSTRIAL FINISHING especially outstanding and valuable. Readers are urged to look over the January issue as soon as it arrives, write for further information about items of a special interest, and then place the magazine in a safe place where it will be handy for reference again and again throughout the coming year.

Safe Economical Ovens For Bake Finishing

Modern ovens for bake-finishing should be tightly constructed to prevent air infiltration, and should have a minimum of

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"through" metal. Both of these requirements are to minimize heat losses, as either the air can carry the heat away, or it can be dissipated by conduction through the paths of "through" metal. Oven builders have spent considerable time designing the oven shell to overcome these weaknesses. A privately built homemade oven would be less likely to overcome these faults.

The heat supplied an enclosure must be properly distributed. Although heat losses can be readily figured from text books on heat losses, the problem of balancing these losses against the sumation of the air quantity and temperature is something that requires experience. A small amount of high-temperature air or a large amount of medium temperature air will carry the same total amount of heat, but there is some proper combination of temperature and quantity of air that will make for even distribution. This is a factor derived from the oven builders' experience.

The subject of safety devices on box ovens is one that requires careful investigation of each individual installation. These safety devices are governed by insurance requirements, and the insurance inspection bureau will demand them. The arranging of this apparatus and its selection is one calling for considerable detailed knowledge of these safety devices.

Due to considerable varied experience in designing, the oven manufacturer has many short cuts in the design, as well as in the installation of this class of apparatus which would not be evident to an owner making his own oven design.

Ovens, especially gas fired, can be very dangerous pieces of apparatus unless all the necessary precautions are taken to make them safe. This is an important part of the oven manufacturer's business.

CHRISTMAS SEALS

Help to Protect Your Home from Tuberculosis

Letters From I.F. Readers

(Continued from page 8)

this information at your earliest opportunity. — Q. S. Co. (Metal and Wood Products).

The information has been given. —Ed.

To Prevent Veneers from Cracking

We are interested in finding a material that can be applied to 3-ply cedar veneers to prevent them from cracking. As the cedar dries out it opens up, showing long hair line cracks. We are interested in a material that can be applied to this, and also any information you can let

Case History No. 19

. . . about a white coating that will not discolor at 600° F.

The growing demand for white and light color finishes for use on stoves, boilers, reflectors and other fixtures for the stove, electric and lighting industries, has brought forth the problem of a coating to withstand high temperature without discoloration.

It took the combined efforts of several research laboratories to produce the final satisfactory solution. The coating developed is known as TUF-ON No. 110. It is applied by spray, and then baked at 400° F. from 30 minutes to an hour.

The resulting finish holds its color at temperatures as high as 600° F., and is very resistant to washing, oils and hard abuse. TUF-ON No. 110 is available in white and light tints as well as in deeper colors.

Those interested in TUF-ON No. 110 or in the solution of a specific problem of their own, are invited to write, furnishing all details to—INDUSTRIAL RESEARCH, DIVISION OF WIPE-ON CORPORATION, 105 HUDSON STREET, NEW YORK. A complimentary copy of "Case Histories" will be sent covering this problem and others, such as non-discoloring white metal finishes; burnproof enamels; two-tone finishes; eyelet coatings; 10 minute air dry metal finishes; airplane finishes and seam compound; and coatings to resist alkali, alcohol and acids; together with a solution of your individual problem.—Adv.

us have in regard to stopping the cracking.—B. A. Co. (Paint and Varnish Products).

The name of a material for this purpose has been submitted.—ED.

Flock Wanted

Will you kindly send us the names and addresses of manufacturers of flock-wool, cotton, rayon, etc.? We are writing to you at the request of one of your patrons, who suggested that you would most likely have a list of many such manufacturers.—L. A. Studios.

We are interested in suede finish for furniture only. If you know of a firm who could give us any information on this product, please forward our name to them to save time. —W. W. Co. (Furniture Specialties).

Finishing Maple

We are very much interested in the article about "Finishing Maple," on page 40 in the October issue. Could you tell us where we could get the materials used in this finishing, with instruction for use? Any assistance you can give us in this matter will be appreciated.—A & A Co. (Chairs).

Finish Testing

On page 26 of the August, 1933, issue of INDUSTRIAL FINISHING, in the bottom of the left-hand column, you give information regarding a machine for testing finish materials on finished products. We would appreciate it very much if you would communicate with the makers or suppliers of this machine and have them forward us full particulars and details regarding price, method of operation, and the results obtainable. —P. B. R. Ltd., Sydney, Australia.

The machine is a product of Atlas Electric Devices Co., Chicago, Ill.—ED.

Fabric Cleaner; Hand Graining

In our auto refinishing shop we do work for about 15 dealers in this section. Several customers have come to me with cars that were in bad shape (badly soiled) inside and they want them put in good shape. We

have an emulsion that we spray on the door pads and head linings that is very good, but it takes about two quarts for a dirty job. Is there anything else on the market we could use?

The window moldings inside, we have been finishing in solid colors but the dealers want them grained like a new car. We have done everything possible to get this effect, but have not had very good success. Is there any way we could do these without going to a big expense?—W. J. E.

Manufacturers of fabric cleaners have been notified of this inquiry.

As for the hand graining of inside window moldings, we refer you to Meyer Rotor's 2-part article entitled "Reproducing Wood Grain on Metal Surfaces," published in March and April, 1938, issues of INDUSTRIAL FINISHING magazine.—ED.

Marine Engine Enamel

Our requirements call for a brushing enamel or lacquer for finishing marine engines. The enamel or lacquer used should (without necessitating bonderizing, sheridizing or some such process) be something of a rust inhibitor. This finish would also be applied on surfaces which, under certain conditions, become practically red hot (iron). The finish is also subject to salt spray on occasion.

We are now using ——— which, while satisfactory to a certain degree, we would like to better. Can you put us in touch with a manufacturer who is already supplying such a finish to marine motor or auto motor finishers? — C. Motors Corp.

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Practical Japanning and Enameling

HERE is the first authoritative handbook of its kind, containing much information that has never before been published. You will find between its covers facts, processes, and formulae that have been considered secret by many japanners.

The author has actually been doing this work for others for many years and he knows whereof he speaks. No one has ever gone into the subject of metal finishing more deeply than he nor has the subject ever been explained so clearly and effectively. This book was eight years in preparation.

Color plates and a multitude of tables and illustrations make the text even more clear and understandable. The volume is bound in harmony with its companions of the Practical Finishing Series and makes a rich, attractive appearance . . . 22 chapters.

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